Some Observations about the Feynman Integral
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After presenting the prodistribution approach of C. de Witt-Morette for the Feynman integral, we clarify the close relation between this approach and a particular product integral.

Stochastic Quantization of Constrained Systems
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The stochastic quantization method originally introduced by Parisi and Wu is extended to describe a constrained system. We first show that a constrained Langevin equation, with the constraints imposed throughout the whole hypothetical stochastic process, yields the Faddeev-Dirac path -integral measure for the constrained system as its thermal equilibrium distribution. Next we propose, by analogy with the theory of optimization, rather moderate constraints which are so designed as to coincide with the original ones at an infinite fictitious time limit. Through numerical simulation of lattice nonlinear σ-model, it is also shown that the formalism gives us a feasible method to carry out numerical analysis of constrained systems.

Self-regularized Field Theory in Parisi–Wu Stochastic Quantization Method
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The regularization problem of ultraviolet divergences in field theory is investigated from the point of view of the stochastic quantization method (SQM). A few examples of the possible self-regularized field theory are proposed by modifying the original Parisi–Wu SQM which is formulated on the basis of a Langevin equation to describe a hypothetical stochastic process of the Wiener type. The analogy of electric circuits with high-frequency-cut filters in a heat bath is useful in such modifications. In particular, some of the modified Langevin equations describe a sort of Ornstein-Uhlenbeck process. We discuss in detail the SQM of the O-U type as a natural extension of that of the Wiener type.

Quantum Mechanical Mutual Entropy and its Applications to Stochastic Processes
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We have several entropies playing fundamental roles in statistical physics and information theory. After Shannon, many works about entropies have been carried out for commutative dynamical systems (CDS for short) so that we have a rather complete building of the entropy theory for CDS. On the other hand, the entropy theory of noncommutative systems (NDS for short) has been initiated by von Neumann, and it is still on a stage of developing. The NDS is generally described